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A VISIT TO THE EXISTING HERDS OF BRITISH WHITE WILD CATTLE.

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[*Preliminary Remarks.*—A considerable degree of interest attaches to the few remaining herds of wild white cattle which are still preserved in Great Britain, since these animals, according to the high authority of Professor Rütemeyer, are less altered from the true *Bos primigenius* type than any other existing breed of cattle, although they do not equal in size their wild progenitors. Fossil remains of *Bos primigenius*, the *Urus* of Cæsar, and also of *Bos longifrons*, a very distinct species of smaller size, both of which were domesticated in Britain, are found in the more recent tertiary deposits over the greater part of Europe, including the British Islands.

Bos longifrons, a small fine-legged, short-horned animal, is called by Prof. Boyd Dawkins the Celtic Short-horn, because it was the only domestic ox of the Celts. It was certainly domesticated, however, before the Celtic invasion, and the term "long-faced ox" is perhaps preferable. It was the only ox in Britain in the time of the Romans, and afforded sustenance to their legions. From it the small dark breeds of Wales and Scotland are descended; and it survived until recently in Cornwall, Cumberland and Westmoreland.* The remains of *Bos longifrons* are plentiful in the English fens, and seem to have afforded a staple article of food in the neolithic period. Mr. Sydney Skertchly has found immense numbers of the bones of this animal in what are probably the remains of a Stone Age lake-dwelling at Crowland. At the great flint implement manufactory at Grimes Graves, near Brandon, the remains of this animal are very plentiful, and belong chiefly to very young calves. It would appear from this that a principal element in the food of these people was milk, and therefore they could not afford to keep the calves, which must have consumed a large portion of what would otherwise have been available for the use of the household.*

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* Skertchly, 'Fenland, Past and Present,' p. 343.

Bos primigenius, the gigantic ox called *Urus* by Cæsar, was a grand animal, readily distinguished from the other species by its massive build and larger bones. The fossil remains of the wild animal are found in British palæolithic deposits, but not in neolithic.† It was, however, domesticated during the late neolithic age in Switzerland and Italy, and co-existed with the smaller *Bos longifrons*. It was re-introduced into England about A. D. 449, and eventually took the place of the smaller species, except in those parts of the country which, from their mountainous character, afforded shelter to the oppressed Britons.‡ The *Urus* seems to have become wild in Britain, and from this species the few herds of wild white cattle which still live in a semi-wild state are descended. Gilpin says, "We cannot positively fix the time when these creatures ceased to exist in this island in a state of freedom; but we can at least say that they did so exist within three hundred years."§ Herds of this breed are recorded to have existed in a semi-wild state at Kincardine, Stirling, Cumbernauld (Dumbartonshire), Cadzow (Lanarkshire), Drumlanrig (Dumfriesshire), Chillingham (Northumberland), Bishop Auckland (Durham), Burton Constable and Gisburne (Yorkshire), Lyme (Cheshire), Chartley (Staffordshire), and Wollaton (Nottingham). Those at Burton Constable were all destroyed by a distemper.‖ When Bewick published his 'History of Quadrupeds,' at the close of the last century, he was enabled to show that only *five* herds then existed, namely, those at Chillingham, Wollaton, Gisburne-in-Craven, Lyme, and Chartley.[*] Since that date the herds at Wollaton and Gisburne have died out, and the breed having been introduced (subsequently, it is presumed, to Bewick's notice) or re-introduced at Cadzow (Hamilton), in Lanarkshire, the ancient seat of the Dukes of Hamilton, there now survive at the present time *four* herds only, of which the following account is given from recent inspection by Mr. A. H. Cocks. Of these the Chillingham breed, belonging to the Earl of Tankerville, are said to be the purest. They are characterised especially by the form of their horns, which may be described as curving first backward and upward, and then sweeping forward and downward, while the points turn upward. In the skull the forehead is flat or slightly concave, and the occipital ridge between the horns is straight and level. In form these cattle are beautifully shaped, with small heads, straight backs, and short legs. Their colour is white, except the ears and muzzle, which are either red or black, according to the breed. The horns are white, with black tips.[†]

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* Greenwell, "Grimes Graves," Journ. Eth. Soc., vol. ii., p. 431 (1871).

† A magnificent articulated skeleton of *Bos primigenius*, found in Burwell Fen, is preserved in the Zoological Museum at Cambridge, where may also be seen the greater portion of a skull of another specimen, in which a stone celt was found and still remains imbedded.

‡ Skertchly, 'Fenland, Past and Present,' p. 344.

§ 'Forest Scenery,' Lauder's edition, 1834, vol. ii., p. 281.

‖ Id., p. 283.

In October, 1872, at the invitation of the Earl of Tankerville, H.R.H. the Prince of Wales paid a visit to Chillingham. During this visit an inspection of the wild cattle was made, and the finest bull in the herd was ridden out and shot with a rifle by his Royal Highness. The head of this animal was preserved entire. A figure of it, with a description, and some account of the herd by Mr. Tegetmeier, appeared in 'The Field' of November 30th, 1872. At that date there was said to be 1500 acres of wood in the park, and the herd numbered between sixty and seventy head.[‡] The late Edward Blyth, one of the ablest of modern zoologists, saw this head after it had been preserved, and thus wrote of it:—"I was surprised at its small size, and also at its identity in every essential particular with the Highland 'Runt,' which I was not prepared to expect from the published descriptions. That it is a form of typical or unimproved *Bos taurus*, unmodified by the modern cattle-breeder's skill, seems to me to constitute its chief claim to the attention of zoologists. Artists should bear this in mind when representing it. That it has any peculiar claim to be descended from *Bos primigenius* I fail to perceive, and should rather point to domesticated *Bos longifrons* as its immediate ancestor. *Bos primigenius* bears in its turn the same relationship to the older (but still post-tertiary) *Bos giganteus*, which the contemporary and still existent *Bison europæus* bears to the older *Bos priscus*." This view, it will be seen, differs somewhat from that of Prof. Rütemeyer, whose opinion, if we mistake not, was based on a skull or skulls of the Chillingham breed presented to him by the Earl of Tankerville.—Ed.]

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[*] Bewick, 'General History of Quadrupeds,' 3rd ed., 1792, p. 35.

[†] Bell, 'British Quadrupeds,' 2nd ed., p. 372.

[‡] Perhaps the best account which has been given of the Chillingham cattle is that published in vol. ii. of the 'Annals of Natural History,' by Mr. J. Hindmarsh, who derived much of his information from the Earl of Tankerville himself. Those who wish to pursue the subject further may consult 'The Agricultural Survey of Northumberland,' 3rd ed., p. 141; 'Proc. Brit. Assoc. at Newcastle-on-Tyne,' 1838; Youatt's 'Complete Grazier,' 11th ed., 1864, pp. 2, 3; and Darwin's 'Animals and Plants under Domestication;' in addition to the works already quoted.

Chartley.—On June 29th, 1877, we walked up to the cattle in Chartley Park, Staffordshire (the seat of Earl Ferrers), and after they had once or twice moved away from us a short distance, keeping in single file, they allowed us to come up within ten or twelve yards of them without showing the slightest further symptom of shyness. There were sixteen animals together, and one sickly cow which kept by herself a few yards from the herd, making a total, inclusive of a bull, cow and young calf we had previously seen in the distance in another part of the park, of twenty head. They stand about as high as the Jersey breed, the bulls looking almost bison-like in shape, with very thick, solid fore-quarters, and very light and "tucked up" about the back ribs. The udder of the cows is very small, inclining forwards, reminding one of a sheep's.* The teats are black or blackish. The black on the nose extends a little (about an inch) beyond the naked part; some have a very little on the lower lip. Several have their fore-legs half way up to the knee lightly dotted with small black spots. The whole of the inside of their ears and about half of the outside, coal-black. The proportion of black on the outside varies a little. Young calves are of a bright white, older animals rather duller, while the old bulls, bullock, &c., are dirty white, or cream-colour; but this latter is perhaps the colour of their skin, showing through their extremely thin coats. The herd is made up somewhat as follows:—One nine-year-old bull; one five-year-old bull; one bullock; five or six young bulls of different ages; two young bull-calves (one called two months old, the other two or three weeks, at the date of my visit); the remaining nine or ten being cows and heifers of various ages. They breed at any time of the year, but more calves are said to be born during the spring than at other times. Black calves appear to be of frequent occurrence, but they are always killed. Two such were born last winter (probably about the end of January). My conductor, Abel (an old man who had been there all his life), told me that when a calf other than white is dropped it is invariably entirely black, and never either piebald or of any other colour than black. The cattle are extremely quiet, and Abel did not seem to remember any instance to the contrary, except naturally when one had been caught up, &c. They feed them in a pen in the winter, giving them the best hay; the young ones are taken up before the older animals. Abel said there was a sort of legend that the herd could not be got up beyond twenty-one head, so the present Earl's father set to work to try the experiment, and succeeded in getting the number up to forty, thereby proving the legend to be "all a tale." The park is 1000 acres, and contains, besides the cattle, red and fallow deer, and about forty horses are turned out into it. I went up to the Hall to look at what heads there might be stuffed. Measurements of heads of all the four herds will be found together at the end. With respect to the mane that wild bulls were formerly credited with, the idea perhaps arose from the necks of the old bulls being of a darker shade of dirty white or cream-colour, than their bodies, and a very few longer hairs appearing on their crest and dewlap. The direction of the horns of this herd is peculiar; those of the full-grown bulls go rather out and very much down, and then turn upwards and outwards. The cows' horns go nearly straight outwards on each side, and also bend somewhat downwards at their base. Some time ago they exchanged a yearling bull with Lyme, but the one received in exchange was so different looking that they would not breed from him, and finally killed him. Two years ago they bred a female calf between a wild bull and common cow (I do not know her colour). The heifer is said to be almost exactly like the wild cattle. I only obtained a distant view of her: it struck me that she was of a brighter white than ordinary white cattle.

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* This is also the case with the cows of the European Bison.—Ed.

Lyme.—The herd at Lyme Park, Cheshire (the seat of W. J.

Legh, Esq.), was, on June 30th, 1877, at an alarmingly low ebb. It consists of the following individuals:—One old bull, eleven or twelve years old, which was expected to die all through the previous winter: he is now kept in a field just above the garden, where I found him lying down in a shed. The naked part only of his nose is black; his ears also are black, but not as decidedly so as the Chartley beasts. One bull about five years old—the individual above mentioned as brought from Chartley as a yearling. He looked scarcely so heavy in front as the two old bulls at Chartley, but another year or two may perhaps alter this. One cow, about ten years old, very little heavier in front, or lighter behind, than an ordinary cow; nose flesh-coloured, slightly smutted with black. Ears, so far as I could see, black about one-third of their length outside, and dull reddish, or nearly black, inside. The horns come right round, downwards and inwards, the tips almost pointing to each other. This cow is said to be very bad tempered, and I was especially cautioned by the old man who has charge of them against her, so I did not go nearer to her than seventy or eighty yards, at which distance she did nothing worse than look excited, tossing her head and flourishing her tail. A boy whom I saw afterwards down at the farm told me that when another cow died, a few years since, this old cow would allow no one to come near the body for three days; a man dressed up in woman's clothes, but to no purpose. The cow that died was one of the progeny of the old one. One black cow, rising three years—the first calf by the Chartley bull out of the old cow. This, I was assured, is the first known instance of a coloured calf being born here, and is perhaps the only coloured example which has been allowed to live in any of the herds. The first time I went to look at these cattle I passed her over, supposing her to be a tame cow turned out with them, the only thing I noticed about her being the way she threw up her head as I approached,—but I thought this was a habit she might soon have acquired in such company,—and also her fine-bred looking legs. On learning that she was a genuine wild one I returned to their run, and took more particular notice of her. She has an irregular white blaze on the forehead, a narrow line of white along the backbone, beginning a few inches in front of the withers; top of head (occiput) white; a few white hairs on crest of neck; tail white; brisket and belly white, the black coming down rather lower behind the fore-legs; narrow bands of white round legs just above the knees and by, or rather below, the hocks. She has a fine glossy, smooth coat. Horns much the same shape, and put on at the same angle, as the horn-cores of *Bos primigenius*, with black tips. Nose black; udder white. The end of her tail just reaches the ground, Two heifers, not quite full grown—one out of each of the existing cows; both, I believe, by the Chartley bull. One of them—I imagine the black cow's calf—has the nose black and a little black on fore-fetlocks, and black ears. The other has flesh-coloured nose with black smutting, and rusty black or reddish inside of ears. These five last-mentioned are on the moor, which is said to be about seven miles in circumference. I found them feeding near the lower edge, where the grass was very rough, with rushes. At the farm they have a yearling heifer by the Chartley bull out of a common cow, which was, according to the farm-boy, a roan. The heifer is exactly like the wild breed—black nose and ears, &c.—except that the proportionate size of her fore and hind quarters seem more equalized, as in a tame animal. Also a very small heifer, about the same age as the last, or even possibly older, given by Mr. D. Assheton Smith, who I understand has a herd of white cattle in his park (Bala, North Wales), and one man believed that he had procured them from Scotland.* This heifer has a dull, almost lead-coloured nose, and long rough coat, with pink insides to the ears—an ugly, stunted-looking little thing. These two are both, I fear, going to be added to the herd,—and are, indeed, reckoned with it now, as I was told it consisted of eight head,—which seems a very great pity. A garden man told me that about thirty years ago the herd numbered as many as thirty-four.

Chillingham.—Visitors to Chillingham Castle, Northumberland (the seat of the Earl of Tankerville), are requested not to go into the park unless with the park-keeper, and as the cattle are shy here (far more so than even the red deer), the park-keeper, Mickie, only takes one so as to get a distant view, in order not to frighten them; for, as he says, they can take plenty of exercise for themselves, without being made to gallop for every visitor that comes to see them. Hence, although I had excellent distant views on July 4th and 5th, I was unable to inspect this herd closely. The

* If so, can they be from one of the four herds, now extinct, mentioned in Bell's 'British Quadrupeds,' 2nd edit., p. 370, as having formerly existed in Scotland?

park covers the side of a hill, rising to about 800 feet above the Castle, and faces nearly due north.* Entering at the lower side, we very soon saw, at some distance off above us, fifteen beasts—cows, yearlings and calves—just below a big wood, into which they all gradually disappeared. After about half an hour, several—at first about five, then two or three, and a single one or two—came down at a good pace out of the wood, downhill and towards our left, and disappeared again into another wood on that side. After again waiting for some time without seeing anything more of the cattle, we came away, as Mickie wanted to get back in time to take charge of a party he was expecting. I afterwards went, with this party, up the road on the west side of the park to about two hundred feet from the top of the hill. When we entered the park, and going some little way further onwards and upwards, we presently heard the herd, or at least the bulls, below us, bellowing—a peculiar sound, almost a cry, very different, I fancied, from the lowing of domestic cattle. On getting out at the end of the wood in which we were, we saw the whole herd, consisting of fifty-nine head, over the tops of the next belt of wood, in the low ground below us; and a fine sight it was, the herd for the most part standing still, a bull occasionally bellowing and moving a few steps, two young bulls now and then indulging in a little butting-match, then one—perhaps a heifer—would "frisk," something like a horse shying, and go curvetting away sideways for a few yards, then suddenly stand still, except that its tail slowly swung from side to side. Some of the party had very soon seen enough and wanted to return, so we were all obliged to go. The view up there was magnificent, all the background to the north being the Cheviots, except a large gap through which we could see into Scotland,† the sea on the east, and a fine panorama of hills on the west. Having seen the party off the premises, Mickie took me to see the hybrid calves, at the farm, by a wild bull out of short-horn cows. They consist of a heifer born June 10th last (the cow's first calf) and a bull born June 17th. The latter's ears are rather bright red inside and nearly half their length externally, the two colours in no way blending, but meeting abruptly; nose red, smutted with black, and the colour extending over the hair beyond the naked patch for about one-third of an inch. The heifer-calf's nose red, but only the naked part; ears pale red (more like the wild type), with some long rough hairs inside. The next morning I again went with Mickie and a party, and entering the park at the lower end, as I had done the previous morning, we very soon saw about forty-seven of the herd, up, on the pasture at the lower part of the hill. They were feeding, and about half of the animals would have their heads down at the same time. The bulls, as before at Chartley, put me in mind of pictures of the European bison, being very "humpy" at the withers and deep in the dewlap, which Mickie said reaches below the knee, and all the neck is pinkish brown,—or pinkish drab more nearly expresses it,—giving quite the appearance at a distance of a short mane. I believe this is mainly due, as at Chartley, to the colour of the skin. Rain coming on, we took refuge in the old "peel" at Hebburn. Afterwards we ascended the hill, leaving the road, and keeping more to the right than we had done yesterday, up to the Roman (? British) camp, which is circular, somewhere about fifty yards in diameter, and surrounded by a single bank about two feet high at the lower side, and about four feet at the upper or south side. It appears to have had only two entrances, one to the north, the other south-west. From here we again obtained distant views of the cattle as they passed slowly between two woods, feeding as they went. The noses of this herd are black, but the black does not—in general, at any rate—extend beyond the naked part. The insides of the ears, with a small portion of the outsides, are pale red.* The whole herd, with the exception of a few of the youngest calves, were suffering from the "rush" from the new grass. Mickie gave me the following particulars:—The herd at the time of my visit (July) numbered fifty-nine, made up of sixteen bulls, sixteen steers,† twenty-seven cows, heifers, &c.,

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* It is said to contain 1500 acres of wood. Cattle have existed here in a semi-wild state for many generations. The park itself is mentioned in records extending back to 1220.—Ed.

† The old forest formerly extended between Chillingham and Hamilton, where a similar herd of cattle, with brown ears, still exists.—Ed.

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* Bewick says, "About twenty years since (1792) there were a few at Chillingham with *black* ears, but they were purposely destroyed, since which period there has not been one with black ears." The ears and noses of those at Wollaton were *black*. Those at Gisburne had the inside of the ears *brown*. The animals in the latter herd were *without horns*, very strong-boned, but not high (Bewick). They are said to have been originally brought from Whalley Abbey, upon its dissolution in Henry VIII.'s reign.—ED.

† I adopt the words in use at each place. They all mean animals operated upon at two years old or so, when they are big enough to show what sort of animals they would turn out.

including one "free martin," which here simply means a barren cow, and not one born at the same time as a bull-calf, for two at a birth is unknown in the wild herd. In Cole's time the herd numbered over one hundred and twenty, and in October, 1872, the herd was said to contain between sixty and seventy head.* Some of the ground has since been shut off, their run being now about 1100 acres, though they never go within two hundred feet or more of the top of the hill. Two years ago they numbered seventy, but a bad winter (? 1875-6) reduced them. An old cow had died a few days before my visit, from having been strained in a bog when weak after calving in the bad weather, and having been hurt by another beast's horn. The two youngest calves were about five weeks old. Mickie has been at Chillingham twenty-five years, the last nineteen of which he has been park-keeper, and he declares he has never known a calf born coloured.† The cattle feed much at night. One bull whom they had tried with oil-cake when in the hovel had eaten it readily; they do not appear to care for turnip, as they never eat what is put in the hovel in winter for the deer. Mickie has known as many as fourteen calves born in a twelvemonth, and as few as eight. This must, of course, depend on the number of adult cows in the herd at the time; but these numbers would, I think (allowing for deaths among the calves, of which he says there are not many), give a calf every twelvemonth to every fertile cow above two years old. None of the cattle here have any black on the fetlocks.

Hamilton.—No orders to visit the High Parks at Hamilton, Lanarkshire, the seat of the Duke of Hamilton,‡ were given during the summer of 1877, on account of the game, but on my promise of good behaviour the Duke's Factor kindly gave me one for July 10th. Half a mile, or rather more, from the park-gate brings one to the "old oaks of Caledon," which are, I regret to say, rather on their last legs, and there are no young trees to take their places. Keeping along the road, I presently found, nearly in the corner of their run, some of the cattle, which turned out to be the herd of bulls and stots, numbering eighteen, which are kept apart from the cows and young calves. By this plan the cows avoid being constantly worried by the bulls, and it insures the calves being born at a suitable season of the year. The stots are inclined to be leggy, while the bulls appeared to be more like shorthorns than in either of the other herds. Keeping along the road one comes to the cows' inclosure, separated by a space of fifty yards or so from the other. Some little way further on, the cows, numbering twenty-five, gradually made their appearance from behind some ground on the right, feeding down wind, as the bulls had done, in consequence no doubt of the gale of wind which was blowing, with driving rain. Presently, as I shifted my position a little, three or four of the cows saw me, and stood still looking at me. One or two of them lowed, and in a few seconds, from behind the rising ground whence the cows had appeared there galloped down thirteen calves, single file, and for the most part close together, and joined the cows, making the grand total here fifty-six. The calves were born during May and June. So far as I could make out with the glass, the outsides of the ears of several of the cows are white; in the majority of the herd the whole muzzle (the hair round the naked part of the nose, and the under jaw to correspond) is black. This dissimilarity was accounted for by the fact that the herd having got rather low, they had lately been keeping every calf to get up the numbers again. All the stots were rather defective in their "points." Some, perhaps all, of the herd are splashed with black about the fetlocks. The cattle-keeper's wife told me that there were three black calves born this year, "without a white hair about them."* The old lady also said that she had "heard tell of coloured ones and spotted ones, just like a common cow;" and that "there are mostly about three black ones born every year," which very soon find their way to the butcher's. The wild cows, here especially, appeared to have a greater development of muscle on the crest of the neck, just in front of the withers, than any tame cows I have noticed. Some years ago some (bulls, I believe) were polled, but now they all have horns, which first go out sideways, and then up, the tips coming slightly inwards, and not having the length or peculiar turn backwards of the Chillingham cattle. They all appear to be somewhat broken-haired, as at Chillingham, many of the cows, as well as the bulls, looking a dirty cream-colour about the neck. The cattle-keeper told me that there had been twenty calves born this year, including five black ones, which he said were always "the bonniest calves, and a' mostly quees." He had heard the story that they were all killed off but one during the last century, and that the way the herd was started again was by breeding with the sole surviving bull and a common cow. During the rinderpest the herd was reduced to eight, not because the disease attacked them, but because they were killed by order of the local authorities, a few young animals being hidden in corners of the park and down coal-mines.

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* See 'The Field,' 30th November, 1872, p. 529.

† "Within a period of thirty-three years about a dozen calves were born with brown and blue spots on the cheek and necks." Darwin's 'Animals and Plants under Domestication.'—Ed.

‡ It is presumed that this is the same park which in some of the older records of wild white cattle is called Cadzow.—Ed.

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* The cattle-keeper, whom I saw afterwards, said there were as many as five black ones this year. Whether the discrepancy is to be explained by two calves having some white about them I did not ascertain.

MEASUREMENT (IN INCHES) OF HORNS ON STUFFED HEADS.

	Length of Horn, round curve.	Ditto in a straight line.	Between tips of horns.	Across fore-head between horns.	Length of head.	Circumference of horn at base.
CHARTLEY:						
Bull	29	...	27	11	19¾	...
,, another *	19	14	37¼	10	18	9½
Cow	20	20	35½	...	17½	...
Ox	33	...	...	...	...	...
LYME:						
Bull †	25	13	9¼	10	21	...
CHILLINGHAM:						
Bull	25	14½	15¾	7½	...	...
Ox	29	...	...	7	20½	...
,, another	19¼	14¾	15¼	6	...	9
HAMILTON:						
Bull	12	9¾	18¾	7½	19½	...
Cow	10½	9	22½	7½	17½	...

* This second bull's head, said to have belonged to the animal killed on the coming of age of the present Earl, is extremely different to any other in this herd, and is much more like the Chillingham heads, being covered all over with curly hair, about 2½ inches long, and the general direction of the horns is upward.

† The only one preserved.

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THE SOUTH AMERICAN MANATEE IN THE WESTMINSTER AQUARIUM.

By the Editor.

For the second time a living specimen of that singular animal, the Manatee, or Sea-cow, *Manatus americanus*, has been brought to England, and may be seen disporting itself in a large glass tank at the Westminster Aquarium. The first example of the kind which reached this country alive was exhibited in August, 1875, in the Zoological Society's Gardens, in an open pond near the Seal Enclosure. It only lived a month, however, owing probably to the water being kept at too low a temperature for an animal accustomed to a tropical climate. Previous to this date more than one attempt had been made to bring over a living Manatee; but although these efforts were unsuccessful, the arrival of some dead specimens, preserved in salt, proved of considerable value to zoologists, for Dr. Murie, who was then Prosector to the Zoological Society, was enabled to dissect and examine them, and he published a detailed account of the anatomical structure, concerning which at that time comparatively little was known.*

The Manatees, or "Sea-cows," as they are popularly termed, inhabit estuaries and shallow parts of the shore in the intertropical regions on the Atlantic coasts of South America and Africa. In structure they resemble the Dugongs, being placed with them in the order *Sirenia*,† and are said to be related to the *Cetacea*, or whales, on the one hand, and to the *Ungulata*, or hoofed quadrupeds, on the other. They agree with the whales and differ from the seals in the absence of mid-limbs, and in the possession of a horizontal tail-fin; but their nostrils are never used as blowholes, although they can be opened and closed at will. They are as truly mammals as are the whales, seals and walruses, having warm blood, breathing by means of lungs, and bringing forth their young alive and suckling them. They have a hairy covering, too, although this is but slightly developed. No outer ears exist, and the eyes are very small. The flippers, or paddle-like fore-limbs, are placed very far forward on the body, and possess rudimentary nails, evidencing the skeletal composition of its terminal parts, which necessarily correspond to fingers.

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* See Transactions of the Zoological Society for 1872.

† The name *Sirenia*, applied collectively to the Manatees and Dugongs, is derived from the fact that these animals have a habit of sitting in a semi-erect position in the water, suggesting by their appearance the travellers' tales of Sirens and Mermaids, the illusion being heightened by their ability to flex their flippers over the chest, and fold their young in this way, so it is said, to the breast.

As might be inferred from the most cursory examination, the Manatee is purely aquatic in its habits. By drawing off the water from its pond, in the case of the specimen which lived in the Zoological Society's Gardens, and which was between six and seven feet long, it was ascertained that the creature is perfectly helpless on land, its only movement being a roll by the aid of the flippers and tail.

The dissection of this individual by Professor Garrod, and the previous examination of the salted specimens by Dr. Murie, resulted in the publication of some interesting information concerning the internal structure and anatomy. The number of vertebræ in the neck is one less than is usually possessed by the majority of mammals. In man and most other mammals the number of the cervical vertebræ is seven; in the Manatee only six, a peculiarity, so far as is known, shared by only one other animal—Hoffman's Sloth.

The mouth is a very singular one, having on either side a pad or side-lip covered with stiff bristles projecting inwards, with which its food, which is purely vegetable, is seized and conveyed to the mouth. The fore-lips, both upper and under, are comparatively small.

The mode of feeding has been compared by Mr. Garrod to that of a silkworm or other caterpillar, in which the jaws move horizontally instead of vertically. Mr. Tegetmeier, in a notice of this animal which appeared in 'The Field' of 6th July last, accompanied by a very characteristic illustration by Mr. T. W. Wood, has suggested that the arrangement of lateral lip-pads has a direct relation to the feeding of the animal on submerged aquatic leaves growing erect in the water like our flags and rushes, as these could evidently be much more easily gathered by lips opening laterally than by such as move up and down. The teeth are absent from the fore part of the jaws, their place being occupied, as in the upper jaw of a ruminant, by horny pads.

The Manatee being exclusively a vegetable feeder, the structure of the digestive organs is modified accordingly. The stomach is complex, with several cavities; the intestines, as in all herbivorous animals, are of great length, being about seven times as long as the body.

The respiratory organs are no less remarkable. The nostrils are circular openings with valves, which are closed when the creature is below the surface of the water. The lungs are of unusual size and great length, enabling the animal, after once taking in air at the surface, to remain submerged for a considerable time before rising again.

The living specimen now in the Westminster Aquarium is fed upon lettuce and water-cress, and is kept in a large tank of water, the temperature of which is maintained at 70°, to suit its supposed requirements, and approximate the surrounding conditions, as nearly as may be, to what is found to exist in a state of nature.

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PROVINCIAL NAMES OF BRITISH ANIMALS.

Norfolk.—In consequence of an intimation, in a recent number of 'The Zoologist,' that local lists of the names of mammals and birds would be acceptable, I have noted the following names now or formerly in use in the county of Norfolk:—

MAMMALIA.

Stoat. *Lobster.*

Weasel. *Mouse-hunter.*

Common Shrew. *Ranny.*

Badger. *Badget; Brock.*

These names for the badger are given by Forby, but are now obsolete, the animal being almost extinct in Norfolk.

BIRDS.

Short-eared Owl. *Woodcock Owl.*

I have also heard this name applied to the Long-eared Owl.

Barn Owl. *Madge; Jill-hooter* (Forby).*

An Owl.† *Billy-wix* (Forby).

Spotted Flycatcher. *Bee-bird; Beam-bird; Wall-bird.*

The two last names are evidently derived from the usual situation of the nest. The first term may be merely a corruption of the second.

Missel Thrush. *Fulfer.*

Apparently a corruption of Fieldfare.

Song Thrush. *Mavish.*

Evidently a corruption of the old English name "Mavis." The cotemporary term of "Merle" for the Blackbird seems to have become quite obsolete.

Fieldfare. *Storm-bird.*

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* See also Hunt's 'British Birds.'

† Probably the Barn Owl.

Common Redstart. *Red-tail; Fire-tail.*

Stonechat. *Stone-chuck.*

Whinchat. *Furr-chuck.*

"Furr" is a corruption of Furze.

Wheatear. *White-rump; Coney-chuck;*[*] *Chock* (Sir T. Browne).

Sedge Warbler. *Sedge-marine.*

I am unable to conjecture the derivation of this name, which has been communicated to me by Mr. F. Norgate as in use on Hickling Broad.

Nightingale. *Barley-bird* (Forby).[†]

Blackcap Warbler. *King Harry Blackcap; Black-headed Hayjack.*

Greater Whitethroat. *Hayjack.*

This name is also applied to the Lesser Whitethroat and to the Garden Warbler.

Willow Warbler. *Oven-bird; Oven-tit; Ground Oven.*

These names are taken from the nest, and are also applied to the Chiffchaff.

Common Wren. *Kitty Wren; Stag;*[‡] *Tom-tit.*

Creeper. *Creep-tree.*

Nuthatch. *Nuthack* (Sir T. Browne).

Great Tit. *Sharp saw.*

Blue Tit. *Pick-cheese.*

This name is also applied, more or less frequently, to the Great, Marsh and Cole Tits. The two latter are called by some "Blackcaps."

Long-tailed Tit. *Long-tailed Capon; Bush-oven; Feather-poke; Pudding-poke; Bottle-tit.*

All these names, except the first, are derived from the nest.

Bearded Tit. *Reed Pheasant.*

Pied Wagtail. *Penny Wagtail*

Common Bunting. *Bunt Lark.*

Reed Bunting. *Reed Sparrow.*

Yellowhammer. *Guler.*

Chaffinch. *Spink; Wheatsel-bird.*

Two authorities give the last as a name applied to the male Chaffinch—probably from these birds congregating in autumn about the season of wheat-sowing.

Goldfinch. *Draw-water; King Harry Redcap; Fool's-coat.*

The last name, given by Sir T. Browne, is evidently derived from the motley dress of the fools or jesters of former times.

Linnet. *Grey Linnet; Brown Linnet; Red Linnet; Blood Linnet.*

The two last names evidently refer to red-breasted specimens, and the two former to those that are not so.

Hawfinch. *Coble-bird* (Sir T. Browne).

Greenfinch. *Green Linnet; Greenolf.*

Bullfinch. *Bloodolf.*

Carrion Crow. *Carner Crow; Carener Crow.*

These are probably merely corrupt pronunciations of Carrion Crow.

Hooded Crow. *Norway Crow; Danish Crow; Harry Dutchman.*

Jackdaw. *Caddaw; Cadder; Caddy.*

Magpie. *Chatter-pie* (Forby).

Green Woodpecker. *Green Woodspeck.*

Greater Spotted Woodpecker. *Black and White Woodspeck.*

Wryneck. *Cuckoo's Mate; Hobby-bird.*[§]

Swift. *Deviling; Devil-bird.*

Nightjar. *Dor-hawk* (Sir T. Browne); *Night-hawk; Razor-grinder; Scissor-grinder.*

The first of these names evidently refers to the food of the bird, and the two last to its note.

Wood Pigeon. *Dow.*

An evident corruption of Dove.

Quail. *Wet-my-lip.*

A West Norfolk name, probably derived from the call-note.

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[*] Probably as frequenting rabbit warrens.

[†] See Stevenson's 'Birds of Norfolk,' vol. i., p. 123, as to this name.

[‡] This name is given by Forby, but its derivation appears to be obscure.

[§] "So called because it comes either with or a little before the Hobbies in the spring."—SIR T. BROWNE.

Golden Plover. *Whistling Plover.*

Lapwing. *Pee-weep; Horn-pie*[*] (Forby).

Ring Dotterel. *Stone-runner; Dot-plover.*

Turnstone. *Tangle-pecker.*

"Tangle" is used on the Norfolk coast as the name of the broad dark sea-weed beset with small bladders.

Oystercatcher. *Sea-pie; Dickie-bird.*

Heron. *Harn* or *Hern; Harnsey; Frank.*

The last name from the note.

Common Bittern. *Bitour* (Sir T. Browne); *Bottle-bump* (Forby).

Spoonbill. *Shovelard* (Sir T. Browne).

An ancient and now obsolete name, another form of which was "Shullard."

Avocet. *Shoeing-horn* (Sir T. Browne).

Whimbrel. *May-bird; Half-bird; Half-curlew; Spowe.*

The first name probably from the season of the bird's arrival: the last a name applied to it in the Household Accounts of the L'Estranges of Hunstanton in the sixteenth century, but now obsolete.

Bartailed Godwit. *Pick.*

Black-tailed Godwit. *Shrieker* (Lubbock).

Green Sandpiper. *Summer Snipe; Martin Snipe* (Lubbock).

Knot. *Gnat* or *Knat; Knet.*

Whooper Wild Swan. *Elk* (Sir T. Browne).

Brent Goose. *Brant.*

Sheldrake. *Bargander* (Sir T. Browne); *Bay Duck* (Forby); *Burrow Duck.*

Shoveller. *Spoonbeak* or *Spoonbill; Beck* (Lubbock); *Popeler.*

The last an ancient name attributed to this duck, but now obsolete.

Pintail. *Sea Pheasant.*

Wigeon. *Smee.*

Garganey. *Summer Teal.*

Pochard. *Poker; Dun bird.*

Scaup. *Grey-back.*

Tufted Duck. *Black Poker* (Lubbock).

Golden-eye. *Rattle-wing.*

Scoter. *Black Duck; Sea Duck.*

Long-tailed Duck. *Mealy-bird.*

Red-throated Diver. *Sprat-loon; Mag-loon* (*i. e.* Magpie-loon).

Great Crested Grebe. *Loon.*

Little Grebe. *Dabchick; Didapper; Dive-an-dop; Divy-duck.*

Puffin. *Parrot-bill; Sea Parrot.*

Foolish Guillemot. *Willock; Willy.*

Gannet. *Herring Gant.*

Common Tern. *Great Pearl.*

Lesser Tern. *Small Pearl; Dip-ears.*

Brown-headed Gull. *Scoulton Pie; Scoulton Peewit; Peewit Gull.*

Kittiwake Gull. *Sea Kitty.*

Great Black-backed Gull. *Saddle-back.*

Gulls generally, especially the larger sorts. *Cob.*

Gulls generally, especially the smaller sorts. *Mow; Sea-mow.*

Many of these names have come under my personal observation, whilst others have been recorded and communicated to me by my friend Mr. F. Norgate and my son, Mr. J. H. Gurney, jun. To these I have added some names taken from Sir T. Browne's notes on Norfolk Birds (temp. Charles II.); from Lubbock's 'Fauna of Norfolk'; from Forby's 'Vocabulary of East Anglia'; and from a few other published sources, including a paper by the Rev. H. T. Frere, which will be found in the first series of 'The Zoologist,' p. 2186.—J. H. Gurney (Northrepps Hall, near Cromer).

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[*] Apparently meaning a pied bird with a crest like a horn.

East Suffolk.—In accordance with the suggestion of the Editor, I venture to send a list of the provincial names of some of the more common animals in East Suffolk. It may be interesting to compare this list with that sent by Mr. Little from the extreme west of the country. Except in the case of the Greenfinch, scarcely two will be found precisely similar.

Missel Thrush and Fieldfare. *Felfit.*
Song Thrush. *Mavis.*
Spotted Flycatcher. *Wall-bird.*
Whitethroat. *Hay-jack.*
Meadow and Rock Pipit. *Titlark.*
Chaffinch. *Spink.*
Greenfinch. *Green Linnet.*
Goldfinch. *King Harry.*
Bullfinch. *Olp.*
Wryneck. *Cuckoo's Mate.*
Nightjar. *Dor-hawk.*
Peewit. *Horn-pie.*
Heron. *Harnser.*
Whimbrel. *Brame.*
Stoat. *Weasel.*
Weasel, male. *White-throat.*
,, female. *Mouse-hunt.*
Shrew. *Ranny.*
Frog. *Fresher* or *Freshey.*
Newt. *Swift.*

No difference, as a rule, is recognised between the Missel Thrush and Fieldfare, both being included under the name of "Felfit." The word "Puttock" still exists here as a surname, although neither Kite nor Buzzard is known except as an occasional visitor. All our larger hawks and very many more of our most beautiful and interesting birds and animals are here persecuted with the utmost rigour, and are fast disappearing altogether. The Magpie is becoming quite a rare bird here, and how the Kestrel still manages to maintain a footing it is difficult to understand. The Pheasant reigns supreme, and everything has to give place to this game-bird.—G. T. Rope (Blaxhall, Wickham Market).

Nottinghamshire. — Seeing in the June number of 'The Zoologist' that you express a wish that some of the readers would send lists of the provincial names of birds, I enclose the following, all of which I have heard used, most of them commonly.—J. Whitaker (Rainworth Lodge, Mansfield, Notts.)

Missel Thrush. *Sycock.*
Yellowhammer. *Goldie.*
Chaffinch. *Spink.*
Goldfinch. *Proud Tailor.*
Pied Wagtail. *Nanny Wagtail.*
Common Wren. *Jintie.*
Willow Wren. *Sweet Billy.*
Redstart. *Fire-tail.*
Black-headed Bunting. *Reed Sparrow.*
Whitethroat. *Peggy.*
Marsh Tit. *Black-cap.*
Blue Tit. *Tom-tit.*
Long-tailed Tit. *Bumbarrel.*
Whinchat. *Utick.*
Heron. *Heronshaw.*
Magpie. *Ninut.*
Woodpecker. *Nickerpecker.*
Corn Crake. *Meadow Drake.*

Oxfordshire.—I have collected the following list of local names during a residence of some years in Oxfordshire:—

Reed Bunting. *Reed Sparrow.*
Chaffinch. *Peafinch.*
Chiffchaff and Willow Wren. *Featherbed.*
Crow. *Gor Crow.*
Creeper. *Tree Clipper.*
Little Grebe. *Dabchick.*
Hedgesparrow. *Billy.*
Jay. *Jay-pie.*
Kestrel. *Bloodhawk.*
Lapwing. *Peewit.*
Linnet. *Furze Linnet.*
Meadow Pipit. *Titlark.*
Quail. *Quick-me-dick.*
Redstart. *Redtail.*
Missel Thrush. *Norman Thrush.*
Song Thrush. *Whistling Thrush.*
Pied Wagtail. *Dish-washer.*
Sedge Warbler, Greater and Lesser Whitethroat. *Haytit.*
Green Woodpecker. *Eccle.*

Whenever any Quail's eggs were obtained by the villagers, they called them "Quick-me-dick's," but I never could learn any derivation for the word.* The Kestrel is called a "Blood-hawk," owing to the blood-red colour of its eggs.—C. MATTHEW PRIOR (Bedford).

Westmoreland.—In compliance with the request of the Editor, for provincial names, I send a list of some which are current in Westmoreland:—

Mistle Thrush. *Chercock.*
Dipper. *Water Crow* or *Bessy Doucker.*
Whinchat. *Gorschat.*
Wheatear. *Stonechat.*
Whitethroat. *Streasmear.*
Pied Wagtail. *Watty.*
Meadow Pipit. *Ling-bird.*
Yellow Bunting. *Bessy Blakeling.*
Chaffinch. *Spink.*
Goldfinch. *Flinch.*
Siskin. *Aberdavine.*
Linnet. *Gray* or *Graybird.*
Starling. *Shepster.*
Raven. *Corby.*
Carrion Crow. *Doupe* or *Black-neb.*
Rook. *Crà.*
Magpie. *Piet.*
Swift. *Devilin.*
Ring Dove. *Cushat.*
Lapwing. *Tuet.*
Heron. *Crane.*
Dunlin. *Sand-mouse* or *Sea-snipe.*
Common Sandpiper. *Willy Wicket.*
Landrail. *Daker-hen.*
Scoter. *Doucker.*
Golden-eye. *Whiteside.*

Want of discrimination is frequently the cause of many different species being called by the same name. Thus, the Garden Warbler, Common Whitethroat and Lesser Whitethroat, in Westmoreland, are all called "Streasmear"; the Blackcap, Great Tit, Cole Tit, Marsh Tit and Black-headed Bunting are indiscriminately termed "Blackcaps." The word "Diver" is still more comprehensive, being bestowed on the Scaup, Pochard, Tufted Duck, and all the species of Merganser, Grebe, and Diver proper, *i. e.*, *Colymbus.*—THOMAS GOUGH (Arnbarrow, Milnthorpe).

* The local name "Quick-me-dick" for the Quail is no doubt an imitation of the trisyllabic note of this bird.—ED.

North Riding of Yorkshire.—I have noted the following list of names as being in use in the neighbourhood of Nunnington, in the North Riding of Yorkshire:—

Blackbird.	*Blackie.*
Blue Tit.	*Tom-tit; Billy-biter.*
Carrion Crow.	*Dowp* or *Dob-craw.*
Chaffinch.	*Bullie.*
Chiffchaff.	*Feather-poke.*
Corn Crake.	*Corn Drake.*
Fieldfare.	*Fellfer.*
Goldfinch.	*Redcap.*
Hedge Accentor.	*Cuddy.*
Heron.	*Heron-sewe.*
Lapwing.	*Teeafit.*
Common Redstart.	*Jenny Redtail.*
Ring Dove.	*Cushat.*
Rock Dove.	*Blue Rock.*
Rook.	*Craw* (Crow).
Starling.	*Gyp; Gyp Starnill; Stare.*
Whitethroat.	*Nettle-creeper.*
Yellowhammer.	*Goldie.*

With regard to the provincial name in this district for the Chaffinch, it may be remarked that the Bulfinch is a scarce bird with us, and its name, in an abbreviated form, is erroneously applied to the former.—Walter Stamper (Highfield, Nunnington, Oswaldkirk, York).

OCCASIONAL NOTES.

Goats eating Tobacco.—I can almost cap Mr. Henry Reeks' story of a Goat eating all the tobacco in a friend's pouch (p. 206.) Nearly thirty years ago, when I was a midshipman in the "Orestes," on the east coast of Africa, we had a goat on board which habitually ate tobacco. I have seen her devour a whole cake of 'Cavendish' at a time. She also drank rum and water with gusto; and on one occasion she ate up nearly the whole of a Latin dictionary of mine,—a "royal octavo" volume.—William H. Heaton (Meadow Croft, Reigate.)

White-nosed Dolphin on the Irish Coast.—We have long had, in the Museum here, a coloured cast of a dolphin, captured, some fifteen years ago, in the vicinity of Dublin Bay, which, lately, by comparing a coloured sketch taken from the fresh animal with the excellent figure given in the 'Proceedings of the Zoological Society' (1876, p. 679, pl. lxiv.), I was able to identify as *Delphinus albirostris* (J. E. Gray). So little is known critically of the Irish species of *Delphinus* that it seems very probable some of the dolphins hitherto passing under the name of *D. tursio* really belonged to *D. albirostris*, of which the figures given in the 'Annals of Natural History' and Bell's 'British Quadrupeds' are very far from satisfactory.—A. G. More (Museum of Science and Art, Dublin).

REARING WATER OUZELS IN CONFINEMENT.—Attempts have frequently been made to rear the Dipper, or Water Ouzel, in confinement, but without success. Mr. Bartlett, the energetic superintendent of the Zoological Society's Gardens, has on several occasions received the newly-fledged young of this bird, and has repeatedly, although unsuccessfully, endeavoured to rear and keep them alive. Whether this want of success was owing to uncertainty as to the proper food to be administered, or whether the peculiar temperament of the bird rendered it unable to brook confinement, was for some time doubtful. By trying almost every kind of insect and other food, Mr. Bartlett succeeded for a while in rearing the birds; but just when his efforts appeared likely to succeed, a change would take place, and the birds would die, one after the other. Sometimes they would get too wet, and would apparently die of cramp; others that had been kept away from the water wasted and died of exhaustion. It was evident that he had not discovered a food that suited them. They had been tried with the usual food for most insect-eating birds, such as scraped beef, and hard-boiled eggs, ants' eggs, meal-worms, spiders, flies, beetles, aquatic snails, shrimps, salmon-spawn, &c., but all failed, until at the suggestion of his assistant, Mr. Arthur Thomson, he tried the experiment of feeding them on scalded meal-worms; it was soon apparent that in this condition the meal-worms could be digested, while in a raw or living state (especially their tough skins) would pass through the birds in a hard and undigested condition. After this experiment, he had little trouble. The birds fed greedily upon half-boiled meal-worms, and were soon ready to leave the nest. He accordingly fitted up a cage, having the nest under a piece of rock-work at one end, and a shallow pan of water at the other, in which the birds soon began to dive and swim about. This spring, Mr. Bartlett procured from Merionethshire six Dippers from two different nests, and under the above treatment they have been successfully reared, and have become very tame. Writing under date June 13th to a contemporary, Mr. Bartlett says:—"They are now about six or seven weeks old, feed themselves or nearly so, being excessively tame, and they still come to be fed by hand. Since they have taken to feed themselves, the food has been greatly varied by introducing caddis-worms, and other aquatic insects of small size, found among the weeds: this affords them much amusement, and they throw up castings, or pellets, after the manner of raptorial birds; the pellets consist of the parts of the insects that are not digested. It is most interesting to watch their movements, bobbing up and down, flying from place to place, and diving under water and extracting the caddis from its curious covering. I can no longer doubt that the charges brought from time to time against our pets—of appropriating a small portion of the young trout or salmon-fry—are true, for they are most expert fishers; but I feel perfectly satisfied they do not eat the roe or spawn of fish. As I have before stated, unless there is some movement, these birds do not eat anything they find. In diving, the Dipper uses its wings as though it was flying under water, and has to exert considerable force to remain under long enough to capture its food; it is so buoyant that it floats to the surface like a cork. The song of the Water Ouzel is said to be louder, but in other respects much resembles that of the Wren. Our young birds already give indications of their vocal music. I can find no very correct description of the movements of the Dipper; I take, therefore, this opportunity of stating that the bird runs about rapidly after the fashion of a Starling. It jumps or hops a considerable distance; it flies well, and swims like a duck."—J. E. HARTING.

NESTING HABITS OF THE STONECHAT, WHEATEAR AND WHINCHAT.—There are, perhaps, no three nests more difficult to find than those of the above-named birds, from the situations chosen, and from the wariness of the owners on the approach of danger. Stonechats frequent commons, heaths, waste places, and the lower sides of hills and mountains where there is furze, brambles, and plenty of undergrowth. Several pairs may generally be seen in the same neighbourhood. I have seen them in numbers in the New Forest, and also on the hills, and by the coast in North Wales. They may be seen sitting on the tops of the bushes and furze, as also on telegraph wires, and are restless and active in their habits. Their song is sweet, and their call-note, which they utter incessantly on being approached, resembles the words, "wee-chat chat; chat chat chat." The nest is placed on or near the ground in a furze-bush, or bank, amongst long grass or undergrowth, and the entrance to it is generally enlarged, probably from the bird's passing in and out to the nest, which is placed some little way in. It is built of moss, and lined with quantities of hair and feathers. I found three nests in Wales this year early in June, one just built, another with five fresh eggs, the third with five eggs nearly chipping. The eggs were all very similar in appearance, of a greenish ground, very like the Blackbird's, and faint brown spots especially towards the larger end. I have one in my possession, on which the brown spots form a ring round the larger end of the egg, but the other specimens are spotted more or less all over. They are about the size of Hedgesparrow's eggs. On the approach of any one to the vicinity of the nest, the male bird, a handsome fellow with a black head and a good deal of white about the neck, immediately gives the cry of alarm, and the female quietly leaves the nest and joins him. They flit about from bush to bush with their "chat chat chat," leading one everywhere but to the nest, and taking care that the coast is quite clear before they return. If the nest be approached suddenly, the female will sit very closely. This bird is said to breed twice in the season, but I never saw any young ones either in May or early June. In their habits of getting insects, on which they principally feed, they resemble the

Flycatchers. Wheatears frequent hilly barren spots, and are found in the neighbourhood of stone walls, old lime-kilns, gravel pits, and similar places, generally preferring wild uncultivated districts, such as mountain-tops and sides, especially old stone quarries. They breed about the middle of May, and conceal their nest in the most clever way; in fact, unless you can detect the birds going to or from it, you may search for hours in vain. I once saw a nest on a hill-side in Cumberland under a huge projecting stone. A friend who was with me, seeing a pair of these birds leave the spot, began to search, and looking under this stone he saw what proved to be a nest. It was at arm's length underneath, built on the ground, and made of hay and dead grass, lined with finer parts of the same material. It was rather a large structure, neatly put together, and contained seven fresh eggs of a very pale blue. This was at the end of May. This year I found one, by watching the birds, on the 3rd of June. It contained young ones nearly fledged, and was built amongst some loose small stones that had been thrown out from where a stone-quarry had been worked. I had to take up a good many stones before I could find it. The young ones came to the surface to be fed. They are very fond of the bottom of a stone wall with an escape on either side, and in such situations I have searched and pulled down stones for hours in a vain attempt to secure them. The birds are very noisy on being approached, and have the same kind of call as the Stonechat, only louder, and with a more plaintive and distinct "wee" before the "chat-chat." Their flight is short and jerky, and they generally settle on walls or stones, or on the ground. They hop with great facility, and hover in the air at times like a Flycatcher while in pursuit of insects. They must be very common in Norway, for their eggs may be purchased there for a half-penny each. I never saw one settle on a tree. The white feathers on the tail are very conspicuous when they fly.—Whinchats, or as they are called here, "Uticks," from their call-note, prefer more cultivated districts, or the neighbourhood of more cultivated districts, than the two preceding species. They arrive in the midland counties early in May, and breed about the middle or end of that month, choosing meadows, mowing grass, and banks by the side of roads, as well as places similar to those selected by the Stonechat. They are often to be found, too, on commons and waste places. The nest is most difficult to find, unless the mowers come across it, which they not unfrequently do. It is built on the ground, and one I found on a bank where there was some furze had a run through the grass to it. I was beating about, and started the bird. The nest contained six dull-blue eggs, very like those of the Hedgesparrow. It is often built at the bottom of a hedge or in the grass at the foot of it, and is a loose structure of grass and moss, lined with fine grass and a few hairs. Sometimes the eggs have a few brown spots on them. The song of the Whinchat is sweet and wild, and the bird may be frequently seen on the top of a tree or the topmost or outside bramble of a hedge, where it sways about with the wind, uttering its call of "U-tick, tick, tick," occasionally introducing a "chat, chat." They feed on flies, beetles, &c., and much resemble Stonechats in their pursuit of them and flight. They sit closely, and make a great fuss on the nest being approached. —H. G. Tomlinson (The Woodlands, Burton-on-Trent.)

The Glossy Ibis in Dorsetshire.—The Glossy Ibis is occasionally met with in the neighbourhood of Poole Harbour. In 1859, to my knowledge no less than six of these birds occurred there; and, as I believe no mention of them has been made in The 'Zoologist,' it may be as well to record them. Five of the specimens in question are now in Wareham, one of them in my own possession. They were killed in the autumn in the upper part of the harbour, or rather on the marshes surrounding the mouths of the two rivers Frome and Trent. They were probably all young birds, being in dull plumage, and wanting the richer shades of chestnut which characterise the adult. A man named Gover told me that one stormy, wet morning in October, 1877, while going down to Poole in a "lighter" behind a tug steamer, just after daylight, he saw four birds on the mud at the edge of a small creek running into the Wareham channel; that they were like Curlews in appearance, but stood a little higher on their legs, and were black in colour. This information he volunteered, remarking at the same time that he had no doubt the birds were "Ibises—same as I shot afore," alluding to the fact of his having killed one of the birds procured in 1859. I think there can be no doubt that this species visited us again last year; but I am unable to state the fact from personal observation. The man said the birds were very tame, allowing the tug and lighters to pass close by them, without offering to move; on their return from Poole the flowing tide had covered the banks, and of course the birds were gone. The man's evidence was corroborated by the men on the tug. I have known him a long time, and he is very intelligent with regard to the harbour-birds. His occupation having necessitated his going up and down between Wareham and Poole on an average oftener than once a day for the last twenty or thirty years, he has naturally had good opportunities for observation. He has not shown much worldly wisdom, however, in the price he has asked and accepted for some of the rarer birds shot by him, *e.g.*, half-a-crown for a splendid specimen of "Sabine's Snipe," and five shillings for a perfect adult-plumaged Common Crane (*Grus cinerea.*) He had some difficulty in getting so much for it, and had actually determined to take it home and eat it, as it was a large fat bird, and he calculated that it would be of more use to his family in the way of sustenance than the half-crown he was munificently offered for it! At last, however, he got his five shillings, and the Crane was saved.—T. M. Pike (Westport, Wareham).

Red-backed Shrike Nesting near London.—Owing to the spread of new buildings, and the cutting down of trees and hedges round London, small birds are very scarce in certain directions. It is, therefore, curious to find so shy a bird as the Butcher-bird making its nest within four miles of Charing Cross. During the last week of May, 1877, I found a Butcher-bird's nest, containing three eggs, in a tall hedge in a field at Kilburn.—Hugh Harting (27, Carlton Hill, N.W.)

Montagu's Blenny (*Blennius galerita*, Linn.) **in Ireland.**—As this little fish is, I believe, not generally known to be found on the shores of Ireland, I may mention that I have captured it in two localities, *viz.*, first (when in company with my friend Mr. William Andrews), in rock pools at the entrance of Dingle Harbour, Kerry, in August, 1868; and soon afterwards, in 1869, I met with it again on the coast and islands of Connemara, where it was often to be seen in the same rock-pools with *Echinus lividus*. It is very similar to small specimens of the Shanny, *Blennius pholis*, but is, of course, easily known by the frontal crest. Specimens from both localities are to be seen in the Museum of Science and Art, Dublin.—A. G. More (Museum of Science and Art, Dublin).

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

Linnean Society of London.

June 20, 1878.—Professor Allman, F.R.S., President, in the chair.

William Cattell, Esq., Surgeon 10th Royal Hussars, Rawal, Pindee, India, was elected a Fellow of the Society.

The Vice-Presidents nominated were George Busk, Esq., W. Carruthers, Esq., Lieut.-Col. Grant, and Dr. J. Gwyn Jeffreys.

Dr. J. Gwyn Jeffreys exhibited specimens of *Virgularia* lately dredged by himself and the Rev. A. M. Norman in the Osterfjord, Norway, at a depth of ten fathoms. These appear to be a species new to science, and will be described as such hereafter by Dr. Danielssen.

Dr. J. Gwyn Jeffreys then read a "Notice of some Shells dredged by Captain St. John, R.N., in Korea Strait." This dealt with but a part of the collection obtained. Of fourteen species enumerated, six, viz., *Anomia ephippium*, *Pecten similis*, *Lepton sulcatulum*, *Axinus flexuosum*, *Panopea plicata*, and *Turbo sanguineus* are noticed for the first time as living in the North Pacific as well as in the Atlantic; *Nucinella ovalis* and *Kellia pumila*, which had been regarded as extinct, the former not only specifically but generically so, are now recorded as recent. The other six species, viz., *Terebratula caput-serpentis*, *Crenella decussata*, *Lasæa rubra*, *Saxicava rugosa*, *Puncturella Nouchinæ*, and *Embolus rostratus* were already known to inhabit the Pacific and Atlantic Oceans. No less than nine out of the fourteen species are coralline crag fossils. The author finds that the present series of shells tends to corroborate views that he had already expressed, namely, that certain species of Mollusca which are common to the North Atlantic and North Pacific Oceans might have originated in high northern latitudes, and have found their way to Japan on the one side and Europe on the other, by means of a bifurcation of the great Arctic current. Captain St. John's independent opinion and observations tend to strengthen this idea.

The Secretary read, for Capt. W. P. Armit, "Some Notes on the Presence of *Tachyglossus* (= *Echidna*) and *Ornithorhynchus* in Northern and North-Eastern Queensland." It is here shown that the *Echidna* occurs at Bellenden Plains, situated some thirty miles N.E. of Cardwell in about 18° S. lat., which appears to be the most northern limit yet recorded in the Australian continent. Captain Armit has met with the *Ornithorhynchus* 150 miles west of Georgetown on the road to Normanton. It also occurs on the Leichardt River, so that its northern limit would appear to be the same, *i. e.* about 18° S. lat.

Dr. J. Murie, in a note, called attention to the above-mentioned *Echidna* skull which had been forwarded for comparison. It agreed in all particulars with that of *Echidna histrix* and that supposed to be specifically distinct,—to wit, *E. setosa*,—these forms now being generically distinguished as *Tachyglossus*. At a glance it could be seen to differ markedly from the new genus and species of *Echidna* (*Acanthoglossus Brujinii*, Peters and Doria) found in northern New Guinea and lately described in detail by Professor Gervais.

The abstract of a paper, "On the Shell of the *Bryzoa*," by Arthur W. Waters was taken as read.

The main points of a paper, entitled "Observations on the White Whale (*Beluga leucas*) exhibited at the Westminster Aquarium" were given orally by Dr. J. Murie. These notes chiefly related to the times and manner of breathing, certain outward peculiarities, visual organ, and movements of body and tail in its progression round the tank, and other subsidiary topics physiologically and functionally considered. Respiration in and out of the water are not quite identical, nor in either element is there perfect regularity in the intervals of respiration. A flow of blood, supposed by some to be of a menstrual character, was shown to have resulted from congestion of the right kidney. The fœcal excrement presented peculiar characters, possibly, however, dependent on the liver being out of order, and long fasting; for the specimen in question does not seem to have partaken of food (or this only very slightly) after capture. A fungus (*Saprolegnia* *ferax*, lately known as the "salmon disease") was detected growing on the skin and particularly plentiful around the spots of injury received during its capture. Another specimen of the *Beluga*, kept in the same tank, was more lively in its movements, and remained longer submerged between each surface respiration.—J. MURIE.

ENTOMOLOGICAL SOCIETY OF LONDON.

June 5, 1878.—H. W. BATES, F.L.S., F.Z.S., President, in the chair.

Mr. John A. Finzi exhibited a remarkable female specimen of *Anthocharis cardamines*, taken in Darenth Wood, Kent. The under side only of one fore wing possessed an orange patch.

Mr. F. Grut exhibited a specimen of an immature *Mygale* from South Africa.

Mr. D. Greig Rutherford exhibited a series of large cocoons sent by Mr. George Thomson from Mount Camaroons, West Africa, formed by the caterpillars of a species of Bombyx allied to *Anaphe Panda*, Bdv. They were taken at an elevation of 5000 feet above the level of the sea, and judging from the nature of certain twigs and pieces of native cord fastened to their exterior covering appeared to have been found attached to fences or to the eaves of houses. It would appear that *A. Panda*, like some other species of *Bombycidæ*, is social, and that the caterpillars unite in considerable numbers in order to form an aggregate cocoon of sufficient strength to preserve the chrysalis from the attacks of enemies, and probably also against extreme changes of temperature.

Mr. H. T. Stainton stated that the two small ermine moths (*Hyponomeuta padella* and *H. evonymella*) of this country were distinguished from one another by the fact that the larvæ of one species spin up gregariously in close proximity, while those of the other species scatter themselves before spinning up.

Mr. Rutherford next exhibited a specimen of a *Papilio* which appeared to be a true case of so-called "hermaphroditism" occurring between *Papilio Cynorta* and *P. Boisduvalianus*, the left side of the wings showing the markings (somewhat interrupted) of the former, and the right side those of the latter species. This specimen seems to confirm the suspicion that the two forms are but the sexes of one species.

Mr. Meldola exhibited photographs of two species of tropical Orthoptera allied respectively to *Pterochroza illustrata* and *P. ocellata*, Serville, which had been sent to Mr. Darwin by Dr. Zachurias, of Chemnitz, on account of the very perfect leaf-like appearance of the fore wings, this "protective resemblance" extending to microscopic detail. The hind wings were ornamented with ocellated spots, probably acquired through sexual selection.

Mr. Meldola also exhibited some beetles of the genus *Spermophagus* and their cocoons, which had been found in a packet of seeds of *Cassia neglecta* sent from Brazil by Dr. Fritz Müller to Mr. Darwin. The full-grown larvæ had emerged from the seeds, leaving the latter in a damaged condition, and had spun the small cocoons from which the beetles had issued, these insects having reached this country alive. Mr. Meldola next exhibited the proboscis of a Sphinx-moth caught by the narrow tube-like nectary of a pale yellow *Hedychium*. This specimen had also been sent from Brazil by Dr. Fritz Müller, who states that Sphinx-moths are frequently found caught in this manner. Mr. Meldola, in conclusion, stated that he had been requested by Dr. Fritz Müller to ask the Members of the Entomological Society to aid him in his microscopical examination of the scent-producing organs of Lepidoptera by sending to him, addressed to Blumenau, Santa Catharina, Brazil, wings of butterflies, especially of such species as are not found in that country, the names of the insects in all cases to be given.

Sir Sidney Saunders communicated some notes by M. Lichtenstein, "On *Phylloxera vastatrix* and other Plant-lice," giving conclusions derived from ten years' breeding of large numbers of root- and leaf-lice.

The Secretary read a paper communicated by Dr. Fritz Müller, entitled "Notes on Brazilian Entomology," in which the author gave the results of his observations on the odours emitted by butterflies and moths, as well as facts bearing on various other subjects more or less connected with the theory of Evolution.

Mr. Meldola, in illustration of the foregoing paper, exhibited the wings of *Antirrhæa Archæa*, showing the "scent-fans" sent over from Brazil by the author of the paper, and likewise a specimen of *Mycalesis Drusia*, Cram., captured by himself in the Nicobar Islands in 1875, and displaying the "scent-fans" of the hind-wings in a very conspicuous manner.

The President remarked that when collecting on the Amazons he had often observed the strong odour of vanilla emitted by certain butterflies. Without a more complete examination of the evidence, however, he was not prepared to admit that the tufts of hair or manes on the wings, &c., of butterflies were the scent-secreting organs.

Mr. Wood-Mason stated that no exception could be taken to Dr. Müller's view from a morphological standpoint, since the hairs, which are modified scales, are in communication with the fluids contained in the tissues of the wing, and thus might easily secrete odours.

With reference to the odours emitted by other insects, Mr. M'Lachlan remarked that when in Sydney he had found, in the bush round that town, a cockroach which gave out a most powerful smell. He also referred to the well-known odour of *Chrysopa*, which is emitted by two or three British species of the genus. No special scent-secreting organ has, however, as yet been detected in these insects.

Mr. Distant stated that he had recently received from the Andaman Islands some cockroaches, which likewise emitted a strong odour.

Dr. Sharp communicated a paper "On some Longicorn Coleoptera from the Hawaiian Islands."

Mr. Peter Cameron communicated a paper "On the Larvæ of the *Tenthredinidæ*, with special reference to Protective Resemblance."

Mr. H. W. Bates read a paper "On *Macropsebium Cotterilli* and other new Species of Coleoptera from Lake Nyassa." The author exhibited a specimen of the remarkable Longicorn beetle above referred to, which is of special interest on account of its possessing some characters of the *Prionidæ*.—R. Meldola, *Hon. Sec.*

NOTICES OF NEW BOOKS.

Narrative of a Voyage to the Polar Sea during 1875-6 *in H.M. Ships 'Alert' and 'Discovery.'* By Capt. Sir G. S. Nares, R.N., K.C.B., F.R.S., Commander of the Expedition. *With Notes on the Natural History,* edited by H. W. Feilden, F.G.S., C.M.Z.S., F.R.G.S., Naturalist to the Expedition. 2 vols., 8vo, with illustrations. London: Sampson Low, Marston & Co. 1878.

On the 2nd November, 1876, Her Majesty's ships 'Alert' and 'Discovery' re-entered Portsmouth Harbour, which they had quitted on a voyage to the Polar Sea on the 29th May, 1875. The expectations which were entertained regarding their reaching the North Pole were not realized, but in the opinion of the Commander of the Expedition, this was due solely to the fact that the North Pole is unattainable by the Smith Sound route.

Of the adventures which befell the gallant officers and crews of these vessels, during their absence of a year and five months, a complete narrative is now given in the volumes before us, and is rendered all the more interesting from the accompanying maps and "permanent Woodbury prints," which exhibit with photographic accuracy some of the more remarkable scenes through which the vessels passed.

The story of the English Arctic Expedition of 1875-6, at least in its general outline, must by this time be tolerably familiar to most persons; for not only have the papers been full of it, but so long an interval having elapsed since the return of the Expedition, many people have had opportunities of hearing, more or less directly, from the explorers themselves, the chief features of interest in connection with it. It has been left to Sir George Nares, however, to bring together in a connected form, first a plain unvarnished narrative of the voyage; secondly, the scientific results of the Expedition, including a metorological abstract and an abstract of results obtained from the tidal observations; and thirdly, an account of the Ethnology, Zoology, Botany, and Geology, as worked out by specialists in every branch of these sciences from the Reports furnished by the Naturalists to the Expedition, and the collections brought home by them.

With the first and second of these divisions we do not propose to deal; for the former has been already commented on sufficiently by far more competent critics than the writer of the present notice, and the latter scarcely falls within the province of a magazine devoted exclusively to Zoology. It is with regard to the third division of the subject that we propose to offer a few remarks, and we are the more disposed to enter into detail on this head, since in all the reviews of this work which have come under our notice, the writers have generally regretted their inability, "for want of space," to deal with the "Appendix," which contains the Natural History of the voyage.

Captain Feilden's contributions last year to 'The Zoologist' on the Ethnology of the Arctic Regions, and the Mammalia of North Greenland and Grinnell Land,* and his excellent paper in 'The Ibis,'† on the species of birds met with by the Arctic Expedition in Smith Sound and northward between the 78th and 83rd degrees of north latitude, may be said to have paved the way for his more extended observations in the first three chapters of the Appendix to the present work. It is unnecessary, therefore, to say much on this portion of the subject, although some of the observations recorded, especially with regard to the northernmost range of the Mammalia met with, are of great interest.

The Walrus, it appears, does not proceed further north than the meeting of the Baffin's Bay and Polar tides near Cape Frazer. On August 31st, 1876, a large seal, *Phoca barbata*, was shot in Dobbin Bay by Hans, the Greenlander, on board the 'Discovery.' It weighed 510 pounds, and on taking off its skin an Eskimo harpoon was found buried in the blubber on its back; the socket of the dart was made of ivory, the blade being wrought-iron. Hans pronounced it to be a Greenland harpoon-head, and suggested that the animal had been struck in the Danish settlements.

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* 'The Zoologist,' 1877, pp. 313—321, 353—361.

† 'The Ibis,' 1877, pp. 401—412.

Although there is no risk of the speedy extinction of the Greenland Whale, *Balæna mysticetus*, it is probable, says Capt. Feilden, that in a few years the fishing will no longer prove profitable to the fine fleet of whalers that now sail from our northern ports; and he sees no hope of Arctic discovery increasing our knowledge of the range of this animal.

The account given of the Musk-ox (vol. ii., pp. 198—202) should be read *in extenso*. Musk-oxen were obtained in considerable numbers near to the winter-quarters of the 'Discovery,' over forty being shot; but in the extreme north of Grinnell Land, nearer to the winter-quarters of the 'Alert,' they were much scarcer, only six having been obtained by the crew of that vessel. The cause of the disagreeable odour which frequently taints the flesh of these animals has received no elucidation from Capt. Feilden's observations. It does not appear to be confined to either sex, or to any particular season of the year; for a young unweaned animal killed at its mother's side, and transferred within an hour to the pot, was rank and objectionable, whilst the flesh of some adult animals of both sexes was dark, tender, and well-flavoured.

The extraordinary development of the claws on the fore-feet of the Lemming attracted some attention, and Capt. Feilden was enabled to determine that this development is seasonal, and analogous to what is observable in some of the *Tetraonidæ*.

The birds met with by the Expedition are well-known Polar forms, and the chief interest lies in the record of their great northern extension in the western hemisphere. The extreme shyness of all the species observed was remarkable. Until nesting time, it was no easy matter to get within range.

Those who, like Capt. Feilden, had been accustomed to find that delicate-looking summer visitor to the British Islands, the Arctic Tern, depositing its eggs on warm shingle under a June sun, must have been astonished to find it nesting in deep snow on a small islet off the north end of Bellot Island (lat. 81° 44′ N.). In one nest was found a newly-hatched Tern, which seemed quite well and lively in its snow cradle. The parent birds had evidently thrown the snow out of the nest as it fell; for it was surrounded by a border of snow, marked by the feet of the old birds, and raised at least two inches above the general level (vol. ii., p. 213). This circumstance somewhat upsets one's notions regarding the cause of migration, which we have been accustomed to consider as dependent chiefly on change of temperature and abundance or scarcity of food. In this instance there seemed to be no lack of food, for there were plenty of fish in the pools between the floes, and the old birds were seen carrying them in their bills. The numerous small crustaceans also, which are common on the shores of the Arctic Sea, would probably furnish sufficient sustenance to the parent birds should fish be unaccessible by reason of the ice.

At page 210 of the Appendix a coloured plate is given of two eggs of the Sanderling, *Calidris arenaria*, which were found by Capt. Feilden in lat. 82° 33′ N., on June 24th, 1876. This nest, from which he killed the male bird, was placed on a gravel ridge at an altitude of several hundred feet above the sea; and the eggs were deposited in a slight depression in the centre of a recumbent plant of willow, the lining of the nest consisting of a few withered leaves and some of the last year's catkins.

The eggs of the Knot, *Tringa canutus*, he was not so fortunate as to obtain, though it breeds in some numbers along the shores of Smith Sound and the north coast of Grinnell Land. It must be common throughout the Parry Islands during summer, for Sabine found it nesting in great numbers on Melville Island. Captain Feilden and his companions frequently sought for the nest, but without success. However, on July 30th, 1876, the day before they broke out of their winter-quarters, where they had been frozen-in eleven months, an old Knot with three nestlings were found on the border of a small lake, not far from the ship. A description of the plumage of these nestlings is given on page 212.

On June 21st, the first nest with eggs of the Brent Goose was discovered in lat. 82° 33′ N., and subsequently many were found (vol. ii., p. 216).

Ten species of fishes were collected between lat. 78° and 83° N., and were submitted for determination to Dr. Günther. Of these, two proved to belong to species hitherto undescribed, and have been named by Dr. Günther *Salmo arcturus* and *Salmo Naresii*. The former, a species of Charr, is the northernmost salmonoid at present known. It comes nearest to the Charr of Killin (Inverness-shire), but differs from it in having a more slender body, rather smaller scales, shorter fins, and a less number of pyloric appendages. Several specimens were procured in the Victoria Lake (lat. 82° 34′ N.), and in fresh-water lakes near Floeberg Beach (lat. 82° 28′ N.). The fish which has been named after Sir George Nares is a small one, the largest specimen obtained measuring only ten inches in length. Several were caught in a freshwater lake near the winter-quarters of the 'Discovery.'

The chief interest attaching to the Mollusca obtained during the Arctic Expedition arises from the collections having been made at localities further north than any which had been previously investigated. The specimens brought home have all been identified by Mr. Edgar Smith, of the British Museum, who has made the Mollusca his special study, and a new species, *Trichotropis tenuis*, has been found amongst them. A description of this shell, with a figure, is given on page 226. A single specimen only was found, in twenty-five fathoms, off Cape Louis Napoleon, Grinnell Land (lat. 79° 38′ N.), by Capt. Feilden.

The entomological collections brought home from between the parallels of 78° and 83° N. latitude, showed quite unexpected and, in some respects, astonishing results. In all, there are about forty-five species of true Insecta and sixteen Arachnida. Of the former five pertain to Hymenoptera, one to Coleoptera, thirteen to Lepidoptera, fifteen to Diptera, one to Hemiptera, seven to Mallophaga, and three to Collembola. Of the Arachnida six are true spiders and ten are mites. These were all placed in the hands of Mr. R. M'Lachlan for examination, and with the assistance of Baron von Osten-Sacken, the Rev. O. P. Cambridge and the late Mr. Andrew Murray, a careful report has been drawn up (Appendix, pp. 234—239). Mr. M'Lachlan has no hesitation in saying that the most valuable of all the zoological collections brought home by the Arctic Expedition are those belonging to the entomological section; for they prove the existence of a comparatively rich insect fauna, and even of several species of showy butterflies, in very high latitudes. Amongst the Insecta is a new ichneumon; and two new butterflies and four new spiders are described. The only species of Coleoptera in the collection is represented by one example of the brachelytrous *Quedius fulgidus* from Discovery Bay, a very widely distributed insect, common in Britain. The paucity of insects of this order, as Mr. M'Lachlan observes, is inexplicable.

The Crustacea collected have been carefully examined and named by Mr. E. J. Miers (Appendix, pp. 240—255), assisted by the Rev. A. M. Norman and Dr. George Brady, and figures are given of some of the more noteworthy species.

In the same way, the Annelids have been worked out by Dr. M'Intosh; the Echinoderms by Prof. Duncan and Mr. W. P. Sladen; the Polyzoa by Prof. Busk; the Hydrozoa by Prof. Allman; the Spongidæ by Mr. H. J. Carter; and the Rhizopoda by Mr. H. B. Brady.

The botanical collections, from lat. 80°—83°, of which Sir Joseph Hooker has given an account (Appendix, pp. 301—326), prove that the vegetation of this meridian of the Polar area is entirely Greenlandic, showing no further relationship than does Greenland itself to the floras of the American Polar islands to the west of it, and of Spitzbergen to the east of it. In other words, it possesses Greenland plants that are wanting in either or in both of these localities, and wants plants that either or both of those regions possess, but which are absent in Greenland. No fewer than sixty-nine identifiable flowering plants and ferns, and half-a-dozen more in too imperfect a condition to be named accurately, have been been brought by the Expedition from the latitudes above mentioned; besides nearly as many more from the Greenland coast south of it.

Capt. Feilden's remarks on the geological structure of the coasts of Grinnell Land and Hall Basin occupy a considerable number of pages (pp. 327—345), and will repay attentive perusal.

If the main object of this Expedition was not attained, it cannot be said that the explorers were less successful than any of their predecessors. In the words of Admiral Richards, "The bold and skilful seamanship which carried the ships to the extreme limit of navigation, and placed the 'Alert' alone in a position in which no ship before had ever passed an Arctic winter, was worthy of the leader, and an earnest of what would have been accomplished had it been in man's power to command success. The subsequent deeds of the officers and crews, under circumstances of trial and suffering which have rarely been equalled, have never been surpassed."

If our knowledge of polar geography has not been greatly enlarged by this the latest exploration, the scientific results of the Expedition have been considerable; and the statistics now before us must be deemed to be well worth the labour expended in procuring them by those to whose zeal and energy the present work will form a lasting monument.

Through the Dark Continent; or, the Sources of the Nile, around the Great Lakes of Equatorial Africa, and down the Livingstone River to the Atlantic Ocean. By HENRY M. STANLEY. 2 vols.; with Maps and Illustrations. London: Sampson Low, Marston & Co. 1878.

THE two handsome volumes, recently published under the above title, may be briefly described, as embodying the result of Mr. Stanley's attempt to solve three important problems of African geography, namely, the true source of the Nile, the extent of the Victoria Nyanza and Tanganika Lakes, and the course of the Great River, supposed to be the Congo, which Livingstone and Cameron had seen at Nyangwè.

The undertaking was a gigantic one, requiring not only nerve, judgment, and great physical powers of endurance on the part of the explorer, but an aptitude for governing a body of men knowing nothing of discipline, and possessing in many cases the most impetuous and excitable tempers; skill in planning the best course out of a difficulty, and promptitude and resolution in carrying out the measures devised.

It is impossible to read Mr. Stanley's narrative without coming to the conclusion that he possessed all these qualities in an eminent degree; had it been otherwise he could never have accomplished what he did. More than this, in the preparation for his journey he displayed much prudence and forethought; and after reading the works of previous explorers in Africa, a retentive memory enabled him to profit largely by past experience of his own and others in the inhospitable wilds which he was to tread.

His design for a boat—or barge, as he calls it—in five water-tight sections, to enable its easier carriage overland on men's shoulders, proved invaluable. It seems certain after his experience of the native canoes which were quite unable to live in rough weather, and went down one after another with stores and guns (pp. 260, 261), that without the 'Lady Alice' he could never have circumnavigated the Victoria Nyanza and Tanganika Lakes.

To any but the most intrepid traveller the extent of these vast inland seas, and the occasional height of their waves would be appalling; but neither this, nor the knowledge of the existence along the shores of hostile tribes who might, and who in fact did, obstruct their landing and prevent their procuring food, could deter the venturous explorer and his followers from carrying out his bold design.

It must have been very cheering to the leader of the expedition to feel that, in the persons of the three Englishmen who accompanied him, Frederick Barker and the brothers Pocock (whose knowledge of boats and skill as watermen rendered their services invaluable), he had with him three stout hearts and three pairs of strong arms which would never desert him in the hour of need; and it must have been particularly trying to his feelings when, after many troubles shared together, many difficulties overcome, and many triumphs achieved, he saw one after another of them succumb, and die before his eyes.

The difficulties with which he had to contend, and the dangers which beset his path at every step, can only be appreciated from a careful perusal of his book. From the day he left Zanzibar, in November, 1874, with an expeditionary force of three hundred and fifty-six souls to provide for, his route towards the interior seemed one continual struggle for existence. Before he had been on the march a month desertions had been frequent (p. 98).

The rainy season began in earnest on December 23rd; and during an eight days' march the expedition struggled through one continuous downpour to Zingeh, the plain of which was half submerged by rushing yellow streams (p. 100). At Mtiwi, on January 2nd, 1875, after an hours' rainfall, six inches of water covered the camp, and a slow current ran southerly (p. 106). Fever, opthalmia, and rheumatism supervened, but still they journeyed on; until in the vast bush-country, through which they struggled to reach Urimi, at the rate of ten miles in as many hours, the guide missed his way, and they were lost (p. 109).

Recovering the right road by well-nigh a miracle, starvation next stared them in the face. Supplies failed, no game could be found, and the party were reduced to an allowance of two cupfuls each of oatmeal gruel. Over thirty men were ailing: some suffered from dysentery; others from fever, asthma, chest disease, and heart-sickness; lungs were weak, and rheumatism had its victims (p. 114). On January 18th Edward Pocock died:

and by the 21st of that month the traveller's diary recorded twenty dead and eighty-nine deserted, between the coast and Vinyata!

The expedition was then little more than half-way between Zanzibar and the southern end of the Victoria Nyanza. Could anything be more discouraging? And yet this was nothing to the trials which were subsequently encountered in the circumnavigation of the lakes, and the journey to the west coast. It was bad enough to put up with hunger and desertion, and to stave off fever and death in the plains; but when to all this was added the risk of shipwreck, and the frequent attacks of hostile, treacherous, and even cannibal tribes, it seems marvellous that a man should undertake to lead an expedition farther, and that anyone should be found willing to follow him. But the stern purpose had been registered; the firm resolve taken to do, or die; and it would have been folly and weakness to have turned back, when half the journey was accomplished. So at least thought the leader of the expedition. The boat must be launched, the lakes explored, their extent determined, their outlets discovered, and the source of the Nile placed beyond doubt. The devious course of the great river which Livingstone and Cameron saw flowing past them at Nyangwè, the westernmost point of the Arab traders from Zanzibar, must be traced, before any idea could be entertained of a return to Europe.

All this was done, and more too. Following westward the course of the Congo, now identified with the Lualaba, and named the Livingstone River, in honour of the great traveller who preceded him, Mr. Stanley crossed nine hundred miles of previously unexplored country, encountering unheard of dangers, in the shape of malaria, cataracts, and man-eating savages, to say nothing of mutiny amongst his own disheartened followers, until at length, having traversed the vast continent of Africa from east to west, he arrived on the shores of the Atlantic. Safe and sound, it may be said, but, alas! how changed in health and appearance! In a portrait taken in England a week before his departure, and forming the frontispiece to the first volume of the present work, he appears a young man with dark hair, in good health, and with a careless expression of countenance which betokens no acquaintance with hardship. In the frontispiece to the second volume we have a portrait of the man as he appeared on his return three years later, aged and careworn, with his hair prematurely grey. But he has lived to see the accomplishment of his fondest hopes and aspirations, and, in the acclamations of his fellow-men throughout the world, to reap the honour which is due to him. May he live to see all his observations verified, and his surmises confirmed.

From the description which is given of the court and character of the Emperor Mtesa, and of his readiness to embrace Christianity, it would seem that there is at length some encouragement to European enterprise to attempt opening the interior of a vast continent.

The important additions to our knowledge of African geography which have been made through Mr. Stanley's instrumentality will be best understood by examining successively the five maps which precede the first chapter in the first volume. Of these maps, which have been most carefully prepared, four show the routes of previous African travellers and the extent of their explorations; the fifth embodies the results of Mr. Stanley's last journey; while two much larger folding maps give, on a more extended scale, the details of his route in the eastern and western halves respectively of Equatorial Africa.

We say nothing of Mr. Stanley's researches in African Zoology, for we learn from the "Publishers' Note" prefixed to this work that in consequence of the size to which it has expanded, it has been found necessary to omit a large amount of valuable matter relating to the Hydrography, Ethnology and Natural History of Central Africa; and that this material, together with the account of Mr. Stanley's explorations of the Rufiji River, will be published in a supplementary volume during the ensuing autumn.

Of the Natural History, therefore, we shall hope to say something later. Meantime we have read enough to convince us that if Mr. Stanley has not thoroughly earned the title of "hero," we do not rightly apprehend the meaning of that word.

Riding Recollections. By G. J. WHYTE-MELVILLE. With Illustrations by EDGAR GIBERNE. Second Edition. 8vo. London: Chapman and Hall. 1878.

THE author of this volume gives us, at the outset, a clue to the general scope of its contents, when he dedicates it "on behalf of the bridled and saddled to the booted and spurred." The text, if we may so call it, is characteristic of the author, not only in its neat terseness of expression, but still more in its spirit of kindly care for the animal that cannot speak for itself. True gentleness is the offspring, not of weakness, but of strength, and this it is that sets its stamp upon all that Major Whyte-Melville has written. It is apparent upon every page of every work of his. It is the hall-mark found only upon true gold—the mark of a kind and manly heart. His 'Riding Recollections' form no exception to the rule. Major Whyte-Melville's horses are his friends, and he would have all who own horses treat them in the same spirit.

Full of anecdote, and of sound practical teaching, the book is a pleasant one to read, and though perhaps the choice of a bridle may be matter of opinion, there is little in the book that we should care to contradict. In his somewhat obvious dictum that "reins are intended for the guidance of a horse, and not for the support of his rider," we cannot too strongly uphold him. It is true that this sort of teaching may be said to be indeed beginning at the beginning, but to how many could we not point who wilfully disregard it. Many a nasty fall might be traced to neglect of this first principle, and for this reason we are inclined to think that a loose rein at a leap, in spite of the many disadvantages enumerated by the author, is the safer course for the majority of men. Left to itself, the horse will clear it if it knows its business, and if it does not, a heavy pull at the bridle is not calculated to teach it.

From the use of the bridle, our author takes us to the abuse of the spur, and here again in one short pithy saying, he gives us the theme of a chapter. "No man," he says, "should arm his heels with spurs until he is so good a rider as to be sure they shall not touch his horse." In effect the Major would have every one win his spurs in the field, as in the days of chivalry he would have won his spurs of gold,—ornaments won by prowess to be worn with honour,—and perhaps in the main he is right. Few people know *how* to spur—fewer still know *when*. Still we are inclined to think that there are times when spurs are a necessity, particularly to a novice, who needs his heels in proportion as he lacks head and hands. More than one "cropper" have we known averted by a timely application of the steel, when nothing else would have availed.

Hand and seat, valour and discretion, have each a chapter to themselves, readable and valuable, in spite of the saying that an ounce of practice is worth a pound of precept. Valour our author holds to consist of two parts, pluck and nerve, and the difference between them he illustrates with an anecdote, which we venture to repeat, at the risk of being deemed retailers of that class of story known as "fine old crusted."

> "'You shiver, Colonel—you are afraid,' said an insubordinate Major, who ought to have been put under arrest then and there, to his commanding officer on the field of Prestonpans. 'I *am* afraid, sir,' answered the Colonel, 'and if you were as much afraid as I am you'd run away!'"

The Colonel, as we are told, had lots of "pluck," but, as he was honest enough to admit, a deficiency of "nerve."

Some critical notes on Irish hunters and thoroughbreds are followed by two chapters devoted respectively to riding *to* fox-hounds and riding *at* stag-hounds. But let not the reader think that it is in any jeering spirit the distinction is drawn. The latter is no less sport than the former, as Major Whyte-Melville has proved in his own experience, though to be sure he has sought it rather in pursuit of the perfectly wild animal over the moorlands of Somerset and North Devon than racing "the calf" in company with Her Majesty's Staghounds and a London crowd. How hard the work can be may be gathered from the sentence quoted from Lord Wolverton—"The worst of a deer is that you can't leave off when you like. Nobody will believe you if you swear it went to ground!"

We cannot conclude this notice without mention of the illustrations. The process of printing we believe to be that known as "autotype," but in this instance it can scarcely be called a success. There is a somewhat blurred and greasy appearance about the plates, which we feel to be unfortunate for much of Mr. Giberne's drawing. We say "much" advisedly, as we do not consider Mr. Giberne to be at all equal in his productions. The fall at the brook (p. 32), and the "flyer" (p. 242), are well and spiritedly drawn, but the enquiring-looking animal in "thrown out" (p. 193) we confess reminds us rather of the rocking-horse type, than of even the mildest horse to be found amongst the crowd at a suburban meet.